

### **In the Claims:**

Please amend the claims as shown in the following listing of claims, which will replace all prior versions and listings of claims in the application:

1-35. (Canceled)

36. (New) A hyperimmune serum-reactive antigen comprising an amino acid sequence from any of SEQ ID NOs: 61-120 or fragments thereof.

37. (New) The hyperimmune serum-reactive antigen or fragment of claim 36, further defined as a peptide comprising an amino acid sequence described in: the “predicted immunogenic aa,” “Predicted class II restricted T-Cell epitopes / regions,” “Predicted class I restricted T-Cell epitope / regions,” and/or “location of identified immunogenic region” column of Table 1A or 1C or in Table 2.

38. (New) The hyperimmune serum reactive antigen or fragment of claim 36, further defined as comprising an amino acid sequence of amino acids: 18-29, 60-78, 89-95, 100-105, 124-143, 166-180, 187-194, 196-208, 224-242, 285-294, 305-311, 313-320, 351-360, 368-373, 390-403, 411-429, 432-470, 483-489, 513-523, 535-543, 548-564, 579-587, 589-598, 604-612, 622-627, 632-648, 55-84, 190-207, 323-331, 370-390, 551-570, 606-614, 633-647, 39-129, 224-296 and 464-609 of SEQ ID NO:61; and fragments in 9 amino acid length starting from the position of: 60, 63, 67, 70, 126, 129, 133, 136, 169, 186, 200, 308, 371, 414, 421, 434, 444, 459, 503, 512, 532, 540, 547, 601, 625, 632, 634, 637, 99, 529, 25, 38, 59, 155, 278, 285, 412, 420, 441, 451, 457, 481, 506, 510, 524, 536, 539, 554, 578, 596, 638, 179 and 604 of SEQ ID NO:61; 4-29, 31-38, 46-64, 66-80, 109-115, 131-139, 152-160, 170-183, 198-234, 239-255, 267-290, 301-313, 318-324, 336-345, 350-365, 380-386, 65-82, 123-165, 268-290, 299-307, 320-329, 336-347, 76-103, 226-239 and 267-333 of SEQ ID NO:62; and fragments in 9 amino acid length starting from the position of: 4, 13, 69, 93, 149, 174, 273, 277, 298, 305, 312, 319, 375, 28, 303, 3, 58, 73, 100, 153, 191, 223, 227, 232, 251, 269, 286, 343, 374 and 238 of SEQ ID NO:62; 20-33, 35-43, 47-60, 77-92, 113-124, 137-145, 185-196, 66-75 and 92-214 of SEQ ID NO:63; and fragments in 9 amino acid length starting from the position of: 32, 48, 49, 113, 77, 118, 139, 185, 2, 24 and 120 of SEQ ID NO:63; 47-64, 137-155, 157-167, 182-198, 212-233, 247-259, 291-303, 315-337, 345-350, 355-368, 373-379, 58-72, 183-196, 249-261, 315-323, 334-342, 347-356, 358-366 and 6-188 of SEQ ID NO:64; and fragments in 9 amino acid length starting from the position of: 135, 160, 183, 184, 204,

249, 256, 293, 296, 318, 319, 356, 372, 94, 13, 60, 159, 163, 189, 204, 220, 233, 300, 333, 335, 356, 362, 198 and 289 of SEQ ID NO:64; 4-36, 43-49, 60-75, 96-107, 113-123, 132-172, 186-193, 217-229, 231-250, 260-282, 284-290, 298-312, 315-330, 5-38, 67-77, 113-127, 134-145, 147-156, 220-236, 271-283, 285-293, 296-304, 309-321 and 159-217 of SEQ ID NO:65; and fragments in 9 amino acid length starting from the position of: 3, 10, 14, 17, 24, 46, 59, 133, 155, 220, 270, 312, 233, 2, 22, 31, 36, 62, 65, 122, 140, 155, 162, 170, 189, 235, 248, 260, 286, 298, 156, 183 and 325 of SEQ ID NO:65; 5-26, 29-50, 52-61, 65-74, 89-96, 140-147, 153-162, 183-188, 191-197, 203-210, 213-225, 1-9, 30-38, 53-63, 70-78, 92-107, 141-149, 158-166, 174-191, 205-224 and 97-113 of SEQ ID NO:66; and fragments in 9 amino acid length starting from the position of: 31, 33, 39, 56, 63, 78, 119, 136, 196, 14, 35, 38, 55, 97, 98, 146, 156, 158, 215, 88 and 214 of SEQ ID NO:66; 31-36, 46-54, 65-80, 86-102, 168-175, 179-186, 188-194, 200-208, 210-216, 225-231, 243-257, 289-296, 362-387, 460-474, 476-486, 504-511, 518-525, 569-579, 581-600, 665-684, 688-694, 700-705, 717-735, 182-193, 202-211, 279-294, 311-319, 369-377, 468-476, 547-558, 579-587, 681-700, 731-740, 92-177 and 591-604 of SEQ ID NO:67; and fragments in 9 amino acid length starting from the position of: 28, 78, 285, 309, 321, 376, 379, 388, 468, 475, 479, 500, 571, 624, 668, 716, 360, 455, 669, 185, 190, 204, 264, 281, 292, 478, 502, 588, 675, 680, 716 and 730 of SEQ ID NO:67; 4-9, 17-24, 27-52, 66-77, 91-98, 104-124, 127-139, 178-199, 211-219, 221-228, 234-244, 246-255, 263-286, 303-312, 316-321, 337-346, 356-362, 367-372, 377-390, 402-416, 449-459, 465-479, 491-501, 503-508, 523-541, 551-558, 560-565, 31-69, 115-127, 132-143, 145-165, 176-187, 190-204, 212-220, 266-286, 304-316, 403-423, 440-456, 523-544 and 9-22 of SEQ ID NO:68; and fragments in 9 amino acid length starting from the position of: 17, 24, 31, 45, 53, 56, 63, 69, 107, 129, 150, 171, 178, 189, 191, 217, 255, 273, 277, 305, 312, 451, 458, 470, 478, 506, 522, 71, 379, 20, 29, 34, 44, 119, 133, 276, 284, 300, 328, 404, 465, 470, 529, 543, 182 and 551 of SEQ ID NO:68; 34-42, 52-63, 71-87, 112-120, 142-147, 154-159, 166-177, 180-197, 204-224, 237-256, 260-268, 280-286, 312-324, 338-343, 372-412, 456-463, 479-490, 494-504, 506-512, 518-524, 538-548, 562-573, 585-591, 597-606, 674-690, 703-712, 714-740, 749-766, 95-103, 114-123, 180-195, 205-220, 240-248, 370-400, 481-495, 588-596, 707-715, 750-765, 160-253 and 630-717 of SEQ ID NO:69; and fragments in 9 amino acid length starting from the position of: 179, 206, 209, 213, 216, 255, 286, 300, 304, 324, 365, 369, 373, 376, 377, 380, 381, 384, 562, 694, 720, 721, 729, 749, 752, 755, 197, 330, 559, 592, 600, 714, 751, 91, 111, 140, 167, 191, 315, 388, 393, 402, 458, 463, 587, 720, 762 and 748 of SEQ ID NO:69; 4-44, 50-55, 59-67, 73-83, 91-98, 101-109, 131-145, 230-236, 267-273, 293-300, 303-310, 349-354, 375-397, 404-416,

434-441, 445-452, 456-468, 479-485, 487-512, 544-568, 571-579, 593-599, 604-610, 614-621, 642-656, 665-678, 706-716, 729-736, 748-756, 780-795, 797-814, 827-844, 850-861, 864-882, 889-900, 906-933, 6-23, 28-36, 64-75, 134-150, 182-192, 227-236, 306-316, 340-350, 376-387, 421-435, 449-460, 527-535, 553-569, 587-595, 641-657, 668-676, 683-694, 743-755, 800-819, 843-865, 861-886, 894-915, 929-938 and 603-669 of SEQ ID NO:70; and fragments in 9 amino acid length starting from the position of: 7, 8, 15, 73, 80, 133, 134, 138, 182, 194, 271, 272, 298, 432, 438, 457, 458, 487, 490, 527, 548, 568, 616, 644, 647, 667, 741, 782, 801, 829, 866, 126, 259, 792, 15, 20, 133, 155, 160, 232, 299, 458, 464, 552, 558, 560, 605, 607, 654, 670, 672, 768, 810, 840, 852, 877, 900, 167, 380, 425, 593 and 907 of SEQ ID NO:70; 4-32, 73-82, 90-101, 116-132, 144-160, 171-182, 195-200, 227-234, 255-271, 293-300, 313-336, 344-350, 369-375, 381-398, 413-421, 436-465, 487-496, 503-508, 510-527, 538-546, 552-562, 608-614, 617-636, 663-674, 679-691, 705-730, 734-748, 769-807, 825-834, 848-861, 864-871, 891-902, 7-16, 90-107, 110-137, 170-187, 197-213, 233-251, 277-287, 291-314, 361-390, 412-425, 451-465, 489-498, 513-521, 570-580, 619-637, 662-679, 713-721, 725-733, 745-754, 766-781, 790-805, 817-834, 868-883, 888-903 and 529-542 of SEQ ID NO:71; and fragments in 9 amino acid length starting from the position of: 8, 23, 53, 57, 128, 169, 178, 239, 263, 290, 297, 310, 324, 331, 339, 365, 398, 436, 443, 450, 470, 485, 488, 513, 514, 520, 614, 669, 711, 723, 771, 824, 849, 895, 316, 861, 118, 135, 196, 225, 284, 290, 370, 454, 489, 492, 521, 557, 624, 632, 745, 778, 783, 850, 868, 910, 226 and 383 of SEQ ID NO:71; 10-18, 30-52, 63-70, 72-79, 96-133, 146-158, 168-175, 184-193, 203-210, 213-222, 227-234, 237-257, 263-273, 285-291, 297-312, 320-338, 359-378, 385-393, 395-410, 412-421, 490-510, 521-527, 540-548, 563-571, 573-585, 592-598, 615-620, 632-641, 652-661, 672-679, 704-711, 717-723, 729-736, 742-751, 766-778, 788-808, 817-824, 836-842, 34-56, 73-89, 103-130, 146-154, 184-205, 213-227, 245-257, 258-278, 292-316, 331-341, 358-369, 372-383, 388-397, 410-418, 503-514, 524-530, 548-556, 565-573, 584-595, 637-646, 656-663, 673-686, 734-742, 745-754, 757-768, 770-781, 816-828 and 14-101 of SEQ ID NO:72; and fragments in 9 amino acid length starting from the position of: 27, 32, 36, 65, 109, 112, 120, 127, 186, 249, 250, 262, 267, 297, 301, 353, 360, 367, 410, 418, 436, 465, 472, 505, 518, 522, 565, 576, 585, 638, 645, 650, 676, 687, 724, 745, 756, 763, 795, 164, 411, 510, 560, 569, 647, 766, 780, 14, 39, 48, 65, 74, 129, 175, 215, 217, 229, 230, 240, 253, 257, 262, 269, 308, 317, 322, 327, 352, 371, 372, 373, 374, 417, 443, 454, 472, 514, 525, 567, 629, 637, 657, 662, 683, 698, 731, 744, 752, 763, 769, 787, 790, 802, 815, 819, 26, 102, 381 and 704 of SEQ ID NO:72; 4-14, 20-33, 36-63, 71-93, 96-104, 106-117, 120-128, 131-147, 161-172, 174-186, 195-210, 212-247, 269-286, 288-301,

306-322, 324-332, 348-354, 356-363, 384-391, 35-66, 70-85, 107-118, 124-132, 165-179, 186-196, 197-205, 276-289, 292-300, 348-368, 369-381, 385-394 and 139-151 of SEQ ID NO:73; and fragments in 9 amino acid length starting from the position of: 34, 41, 50, 53, 109, 127, 134, 153, 165, 271, 286, 297, 340, 384, 80, 321, 334, 354, 33, 57, 110, 153, 178, 276, 284, 383, 79, 99 and 123 of SEQ ID NO:73; 12-20, 37-48, 51-58, 69-75, 86-98, 113-136, 141-161, 171-216, 222-254, 264-273, 291-301, 311-345, 351-361, 31-39, 40-55, 62-74, 121-137, 148-164, 170-178, 223-253, 309-329, 354-369 and 246-275 of SEQ ID NO:74; and fragments in 9 amino acid length starting from the position of: 46, 95, 103, 110, 143, 156, 178, 186, 190, 236, 242, 244, 291, 294, 315, 333, 353, 125, 183, 256, 326, 3, 68, 82, 102, 131, 177, 185, 190, 193, 223, 224, 244, 250, 295, 340, 349, 354, 88 and 89 of SEQ ID NO:74; 30-36, 50-56, 96-102, 110-116, 125-131, 162-174, 179-187, 189-201, 223-230, 232-239, 266-278, 320-328, 330-337, 339-350, 388-400, 408-413, 417-423, 435-447, 456-480, 499-524, 526-534, 53-62, 92-107, 192-203, 315-323, 436-452, 464-483, 502-524 and 61-138 of SEQ ID NO:75; and fragments in 9 amino acid length starting from the position of: 126, 174, 225, 267, 309, 316, 320, 337, 436, 466, 467, 473, 474, 14, 128, 143, 228, 347, 494, 2, 52, 112, 201, 209, 217, 230, 235, 236, 337, 381, 395, 413, 419, 454, 466, 510, 515 and 556 of SEQ ID NO:75; 7-32, 36-56, 77-82, 88-100, 117-144, 153-166, 173-180, 188-226, 256-297, 300-316, 323-337, 339-348, 361-384, 390-427, 438-455, 476-488, 516-523, 535-566, 580-586, 597-607, 615-621, 626-634, 639-649, 654-660, 668-673, 677-688, 707-714, 716-728, 730-742, 746-756, 763-772, 801-808, 820-829, 840-875, 882-888, 895-911, 914-920, 928-948, 953-961, 987-995, 999-1005, 1007-1026, 1053-1060, 1071-1079, 1082-1117, 1123-1129, 6-31, 37-48, 58-69, 90-105, 110-118, 134-142, 146-157, 210-220, 267-276, 291-300, 319-330, 362-372, 393-401, 405-421, 447-456, 463-471, 517-525, 574-582, 597-612, 618-626, 642-650, 656-668, 668-678, 683-695, 725-733, 778-791, 840-849, 894-917, 927-939, 954-963, 966-974, 978-998, 1010-1021, 1056-1067, 1070-1083, 1090-1104 and 325-389 of SEQ ID NO:76; and fragments in 9 amino acid length starting from the position of: 11, 18, 22, 41, 48, 86, 104, 156, 190, 197, 221, 286, 290, 334, 343, 345, 407, 442, 509, 538, 575, 596, 597, 598, 636, 678, 685, 723, 754, 757, 779, 818, 850, 857, 864, 893, 900, 901, 907, 918, 927, 934, 972, 988, 1018, 1025, 1034, 1048, 1065, 1072, 1089, 1094, 1101, 1108, 127, 336, 411, 806, 852, 28, 68, 90, 91, 93, 158, 293, 310, 350, 368, 380, 394, 425, 441, 461, 554, 569, 597, 628, 667, 684, 724, 737, 752, 761, 767, 804, 851, 897, 907, 933, 979, 1030, 1032, 1051, 1075, 1090, 1125, 133, 308, 502, 797, 939 and 960 of SEQ ID NO:76; 11-19, 34-53, 55-91, 113-119, 122-129, 131-140, 157-170, 173-179, 188-195, 200-206, 208-220, 222-232, 236-244, 250-265, 267-274, 282-290, 293-301, 317-323, 336-343, 355-361, 372-384, 33-54,

69-95, 210-221, 244-254, 257-269 and 324-351 of SEQ ID NO:77; and fragments in 9 amino acid length starting from the position of: 32, 37, 43, 47, 50, 53, 57, 64, 68, 71, 73, 74, 78, 80, 82, 113, 120, 155, 162, 194, 205, 209, 231, 235, 238, 252, 259, 266, 273, 280, 287, 294, 301, 308, 315, 333, 8, 16, 18, 66, 377, 36, 44, 81, 99, 124, 193, 261 and 319 of SEQ ID NO:77; 31-55, 58-64, 69-75, 81-90, 129-150, 154-167, 179-184, 189-208, 227-237, 248-271, 277-284, 313-340, 350-358, 361-368, 371-378, 384-390, 418-425, 438-444, 455-468, 487-506, 514-523, 525-550, 558-569, 572-578, 588-598, 607-618, 645-651, 653-665, 672-684, 708-715, 717-742, 754-771, 776-782, 786-802, 806-817, 1-9, 31-46, 52-61, 60-78, 132-148, 182-199, 214-229, 249-264, 280-293, 320-341, 347-355, 386-411, 486-502, 553-575, 624-634, 673-689, 690-700, 702-714, 721-735, 736-746, 757-777, 788-798, 810-818 and 90-100 of SEQ ID NO:78; and fragments in 9 amino acid length starting from the position of: 51, 82, 139, 186, 193, 197, 200, 239, 248, 249, 250, 257, 311, 325, 326, 520, 555, 556, 589, 606, 651, 716, 723, 730, 737, 758, 761, 772, 788, 39, 41, 569, 695, 709, 783, 51, 60, 89, 110, 141, 207, 216, 295, 301, 395, 404, 518, 527, 555, 568, 593, 596, 673, 691, 722, 757, 772, 790, 799, 130, 131, 179, 402, 414 and 701 of SEQ ID NO:78; 13-19, 22-28, 61-67, 74-81, 86-103, 110-122, 141-155, 162-169, 171-177, 181-186, 192-199, 201-207, 225-238, 246-263, 273-279, 287-300, 307-313, 331-336, 351-367, 370-376, 380-392, 395-402, 415-422, 424-451, 454-465, 473-492, 496-509, 515-523, 541-547, 569-582, 589-601, 613-636, 638-647, 653-679, 702-714, 721-729, 739-748, 768-779, 799-813, 821-828, 832-840, 847-853, 857-873, 886-892, 894-905, 917-926, 958-971, 974-981, 983-989, 997-1004, 1006-1032, 1034-1049, 1054-1061, 1063-1069, 1073-1081, 1083-1095, 1097-1115, 1122-1132, 1143-1153, 1164-1171, 1178-1185, 1193-1213, 1216-1251, 1258-1272, 1277-1283, 1305-1317, 1324-1330, 1333-1355, 1383-1390, 25-43, 81-92, 111-141, 150-159, 213-220, 222-242, 243-254, 256-267, 276-288, 289-307, 381-397, 398-409, 422-438, 441-464, 485-500, 515-528, 542-553, 569-585, 591-601, 639-649, 656-664, 709-719, 725-734, 739-753, 841-850, 883-893, 902-911, 912-926, 935-948, 960-969, 976-984, 994-1008, 1037-1047, 1073-1085, 1100-1108, 1124-1134, 1167-1179, 1194-1203, 1220-1254, 1258-1277, 1308-1319, 1348-1366 and 273-290 of SEQ ID NO:79; and fragments in 9 amino acid length starting from the position of: 107, 110, 112, 133, 152, 200, 204, 223, 244, 251, 271, 289, 291, 305, 323, 360, 380, 407, 422, 428, 440, 491, 507, 512, 536, 616, 625, 628, 648, 650, 665, 668, 748, 768, 784, 797, 801, 826, 858, 859, 903, 910, 913, 925, 932, 959, 960, 968, 993, 1008, 1020, 1068, 1072, 1138, 1141, 1142, 1193, 1201, 1218, 1226, 1237, 1261, 1271, 1311, 1348, 1349, 1377, 126, 375, 433, 477, 608, 658, 852, 1106, 1121, 1303, 1362, 24, 102, 151, 164, 169, 211, 229, 245, 274, 279, 285, 333, 348, 361, 382, 391, 397, 428, 447, 453, 480, 496, 590, 591, 595, 615,

623, 629, 638, 664, 669, 672, 738, 744, 775, 789, 840, 910, 917, 939, 966, 977, 1057, 1084, 1096, 1119, 1127, 1128, 1145, 1163, 1167, 1202, 1214, 1238, 1244, 1260, 1279, 1335, 145, 355, 961, 1053, 1103 and 1245 of SEQ ID NO:79; 16-23, 25-47, 49-59, 64-72, 79-91, 95-105, 113-122, 133-145, 148-162, 169-176, 179-188, 190-200, 202-218, 232-239, 250-283, 299-333, 337-344, 349-355, 364-406, 430-437, 439-449, 452-460, 464-490, 492-503, 505-530, 533-562, 12-21, 28-39, 52-67, 115-124, 189-204, 224-232, 234-242, 263-284, 302-322, 363-385, 389-397, 446-463, 479-488, 513-522, 528-552 and 401-419 of SEQ ID NO:80; and fragments in 9 amino acid length starting from the position of: 23, 30, 58, 78, 84, 97, 98, 120, 123, 133, 162, 169, 189, 215, 218, 236, 309, 312, 316, 365, 372, 384, 388, 391, 426, 446, 453, 465, 466, 478, 508, 513, 515, 523, 530, 536, 543, 554, 333, 467, 13, 19, 115, 130, 181, 195, 225, 262, 270, 275, 311, 313, 325, 342, 390, 391, 398, 461, 530, 116, 188 and 229 of SEQ ID NO:80; 8-16, 36-54, 59-76, 85-92, 104-124, 137-180, 199-248, 255-298, 300-307, 324-339, 356-373, 381-393, 402-442, 448-455, 18-27, 36-56, 101-120, 145-158, 165-173, 179-189, 239-255, 255-270, 330-346, 355-375, 383-394, 403-421 and 83-232 of SEQ ID NO:81; and fragments in 9 amino acid length starting from the position of: 5, 102, 149, 156, 160, 164, 185, 186, 204, 208, 211, 221, 232, 264, 270, 273, 277, 280, 284, 287, 317, 329, 362, 387, 398, 402, 404, 422, 429, 431, 449, 37, 298, 359, 9, 17, 35, 40, 41, 105, 111, 146, 166, 234, 279, 343, 384, 412 and 365 of SEQ ID NO:81; 29-69, 71-88, 95-104, 106-130, 143-189, 205-232, 24-40, 46-64, 65-79, 83-105, 121-129, 144-199, 206-236 and 182-199 of SEQ ID NO:82; and fragments in 9 amino acid length starting from the position of: 30, 37, 66, 77, 81, 84, 112, 118, 141, 144, 145, 146, 149, 150, 153, 167, 169, 170, 178, 196, 213, 215, 220, 13, 21, 39, 44, 62, 75, 78, 97, 119, 124, 145, 148, 154, 177, 190, 207, 22 and 216 of SEQ ID NO:82; 4-46, 51-66, 77-88, 102-110, 115-126, 142-148, 171-181, 183-192, 202-212, 227-234, 251-261, 263-278, 283-316, 319-325, 336-352, 362-371, 386-393, 399-406, 410-425, 427-437, 441-450, 457-464, 471-476, 490-496, 514-521, 549-557, 571-578, 601-611, 618-623, 627-646, 657-670, 672-689, 696-704, 726-740, 742-756, 765-776, 778-784, 792-801, 822-836, 862-868, 875-881, 887-898, 914-919, 941-948, 963-969, 971-978, 996-1004, 1007-1016, 1036-1051, 1068-1080, 1082-1090, 1092-1098, 1104-1127, 1135-1144, 1156-1177, 1181-1195, 1197-1206, 1214-1231, 1243-1263, 1278-1284, 1295-1303, 1305-1323, 1337-1346, 1355-1374, 1376-1383, 1406-1423, 1455-1463, 1465-1489, 1506-1518, 1527-1552, 1555-1570, 1581-1589, 1-28, 109-124, 208-220, 261-280, 286-296, 310-324, 398-405, 425-433, 439-454, 504-517, 535-555, 570-591, 599-614, 620-630, 691-699, 711-719, 729-739, 751-760, 783-791, 843-855, 878-886, 890-900, 940-955, 984-1003, 1007-1026, 1065-1073, 1106-1122, 1136-1149, 1188-1198, 1203-1211, 1227-1235, 1249-1256, 1298-1308, 1374-

1392, 1398-1409, 1414-1429, 1436-1444, 1456-1490, 1504-1521, 1530-1547, 1592-1609 and 911-935 of SEQ ID NO:83; and fragments in 9 amino acid length starting from the position of: 26, 33, 79, 170, 200, 265, 290, 297, 302, 304, 333, 334, 377, 412, 414, 415, 431, 436, 458, 465, 481, 494, 536, 546, 568, 605, 678, 690, 697, 703, 724, 729, 730, 735, 737, 767, 776, 797, 840, 861, 938, 968, 999, 1072, 1079, 1085, 1094, 1113, 1160, 1163, 1180, 1188, 1195, 1217, 1245, 1250, 1273, 1302, 1358, 1362, 1363, 1401, 1408, 1465, 1469, 1481, 1507, 178, 960, 1034, 6, 21, 38, 159, 204, 248, 260, 306, 337, 349, 384, 425, 438, 458, 481, 502, 521, 546, 605, 690, 730, 731, 819, 860, 915, 946, 967, 1007, 1018, 1065, 1113, 1187, 1188, 1205, 1223, 1409, 1414, 1495, 1526, 1531, 1537, 101, 255, 1421, 1457, 1538, 1580 and 1589, of SEQ ID NO:83; 15-25, 41-102, 111-117, 127-134, 145-170, 194-201, 207-225, 10-30, 36-44, 46-59, 57-98, 122-138, 144-160, 162-173, 194-217 and 118-131 of SEQ ID NO:84; and fragments in 9 amino acid length starting from the position of: 12, 16, 37, 46, 61, 82, 121, 128, 149, 157, 162, 197, 204, 212, 39, 2, 23, 53, 68, 97, 107, 121, 127, 156, 169, 196, 9, 13 and 114 of SEQ ID NO:84; 7-54, 65-94, 97-103, 154-163, 170-180, 182-199, 216-222, 227-234, 243-256, 267-273, 286-298, 314-322, 324-353, 363-380, 393-401, 424-431, 434-441, 447-470, 475-495, 506-532, 540-548, 554-592, 594-607, 609-617, 619-626, 628-634, 656-662, 8-31, 43-59, 61-75, 93-104, 126-144, 179-201, 244-254, 289-302, 330-338, 364-382, 413-421, 428-466, 476-525, 582-599, 602-619 621-632 and 115-128 of SEQ ID NO:85; and fragments in 9 amino acid length starting from the position of: 9, 10, 13, 35, 46, 76, 77, 83, 151, 165, 179, 187, 195, 283, 326, 338, 342, 360, 365, 368, 375, 415, 450, 485, 508, 556, 565, 569, 576, 602, 5, 20, 130, 181, 251, 271, 288, 294, 333, 355, 356, 364, 446, 451, 467, 483, 486, 523, 544, 611, 214, 219, 323, 399, 424 and 458, of SEQ ID NO:85; 5-21, 32-56, 88-99, 117-124, 128-138, 143-150, 168-180, 183-189, 196-213, 220-240, 254-263, 266-289, 300-313, 321-330, 335-358, 361-371, 380-398, 50-65, 67-87, 96-104, 144-153, 156-164, 169-177, 199-220, 259-289, 324-333, 339-360, 372-385 and 74-93 of SEQ ID NO:86; and fragments in 9 amino acid length starting from the position of: 26, 33, 49, 88, 96, 129, 169, 170, 198, 257, 268, 281, 337, 342, 366, 391, 393, 39, 122, 248, 76, 106, 117, 185, 190, 198, 238, 257, 266, 280, 341, 344, 350, 367, 304 and 384 of SEQ ID NO:86; 12-23, 44-50, 54-60, 91-97, 103-109, 119-125, 131-137, 141-151, 172-183, 201-226, 230-238, 252-265, 315-321, 331-345, 360-370, 376-386, 392-406, 410-416, 422-431, 133-159, 208-222, 354-368 and 1-88 of SEQ ID NO:87; and fragments in 9 amino acid length starting from the position of: 47, 134, 140, 143, 203, 204, 210, 254, 355, 358, 359, 362, 369, 417, 119, 17, 128, 129, 141, 143, 153, 208, 232, 245, 278, 301, 313, 327, 328, 384 and 395 of SEQ ID NO:87; 4-16, 29-36, 39-64, 69-75, 79-87, 90-122, 126-134, 139-173, 184-190, 195-203, 206-213, 216-228, 234-246,

250-257, 260-266, 274-282, 291-312, 318-325, 340-345, 348-361, 364-388, 399-437, 439-448, 451-464, 467-473, 480-510, 514-520, 534-553, 561-574, 579-589, 593-599, 616-655, 658-671, 3-12, 23-38, 27-38, 43-56, 93-107, 123-137, 144-154, 175-199, 229-244, 288-303, 308-316, 323-337, 410-423, 455-473, 488-496, 531-551, 560-577, 577-591, 619-637, 646-660, 664-672 and 553-570 of SEQ ID NO:88; and fragments in 9 amino acid length starting from the position of: 36, 101, 123, 129, 136, 146, 156, 160, 194, 205, 219, 236, 245, 283, 289, 350, 402, 413, 437, 475, 505, 517, 542, 585, 605, 620, 627, 657, 34, 52, 88, 358, 540, 656, 3, 8, 13, 32, 82, 105, 111, 117, 137, 167, 173, 180, 182, 262, 300, 306, 350, 409, 412, 423, 499, 500, 563, 568, 581, 585, 627, 628, 554 and 638 of SEQ ID NO:88; 4-31, 50-80, 83-93, 97-103, 111-116, 123-132, 134-163, 170-199, 205-210, 215-220, 230-247, 249-278, 280-308, 311-329, 337-347, 349-358, 365-371, 376-401, 417-430, 434-446, 459-505, 511-518, 527-535, 537-545, 547-565, 573-581, 592-601, 1-17, 20-30, 66-80, 100-119, 139-150, 171-182, 186-198, 207-221, 228-242, 258-274, 286-308, 314-330, 337-352, 355-376, 383-391, 417-432, 437-446, 462-473, 479-488, 496-507, 514-522, 541-554, 557-565, 576-585, 589-605, 49-60 and 582-607 of SEQ ID NO:89; and fragments in 9 amino acid length starting from the position of: 4, 65, 66, 120, 121, 144, 170, 174, 208, 226, 233, 276, 278, 285, 286, 298, 336, 348, 355, 363, 382, 384, 395, 457, 458, 494, 501, 578, 133, 278, 294, 551, 53, 89, 110, 159, 186, 232, 290, 324, 406, 431, 458, 463, 480, 490, 513, 541, 549, 558, 585, 22, 137, 152, 189, 227, 255, 261, 291, 419 and 569 of SEQ ID NO:89; 9-60, 67-73, 79-93, 109-122, 134-142, 144-153, 165-192, 197-225, 235-244, 259-279, 289-299, 308-317, 321-332, 338-347, 350-361, 373-387, 402-409, 411-421, 439-445, 450-456, 462-468, 470-479, 490-501, 503-516, 16-27, 49-60, 99-122, 136-145, 148-162, 186-194, 213-221, 225-246, 261-275, 281-292, 353-361, 390-401, 451-470, 486-494, 497-516 and 478-490 of SEQ ID NO:90; and fragments in 9 amino acid length starting from the position of: 15, 22, 28, 29, 48, 49, 106, 107, 114, 147, 170, 177, 188, 208, 209, 212, 256, 280, 287, 316, 451, 468, 489, 33, 217, A03: 36, 98, 124, 136, 142, 153, 177, 188, 251, 262, 291, 320, 323, 383, 417, 464, 487, 491, 492, 505, 44, 86, 146, 411, 437 and 499 of SEQ ID NO:90; 4-10, 16-28, 3-14, 16-30 and 2-16 of SEQ ID NO:91; and fragments in 9 amino acid length starting from the position of: 1 and 15 of SEQ ID NO:91; 8-18, 20-30 and 7-15 of SEQ ID NO:92; 4-16, 18-27, 2-13, 20-30 and 10-29 of SEQ ID NO:93; and fragments in 9 amino acid length starting from the position of: 22 and 1 of SEQ ID NO:93; 36-57, 62-92, 46-66 and 27-35 of SEQ ID NO:94; and fragments in 9 amino acid length starting from the position of: 84 of SEQ ID NO:94; 4-18, 1-16 and 5-12 of SEQ ID NO:95; and fragments in 9 amino acid length starting from the position of: 1, 9 and 2 of SEQ ID NO:95; 13-27, 38-52, 1-13, 11-25, 27-37 and 17-36 of SEQ ID NO:96; and



fragments in 9 amino acid length starting from the position of: 16, 37 and 20 of SEQ ID NO:96; 4-17, 27-40, 55-62, 9-25, 34-46, 50-64 and 47-62 of SEQ ID NO:97; and fragments in 9 amino acid length starting from the position of: 7, 10, 11, 14 and 58 of SEQ ID NO:97; 4-9, 1-10 of SEQ ID NO:98; 3-14 and 7-20 of SEQ ID NO:99; and fragments in 9 amino acid length starting from the position of: 2 and 1 of SEQ ID NO:99; 7-12, 24-29, 22-30 and 7-21 of SEQ ID NO:100; and fragments in 9 amino acid length starting from the position of: 4 and 9 of SEQ ID NO:100; 14-30, 15-30 and 3-18 of SEQ ID NO:101; and fragments in 9 amino acid length starting from the position of: 1 and 20 of SEQ ID NO:101; 3-17 of SEQ ID NO:102; and fragments in 9 amino acid length starting from the position of: 1 of SEQ ID NO:102; 4-27, 31-59, 75-86, 93-103, 105-110, 15-44, 51-61, 79-95 and 41-50 of SEQ ID NO:103; and fragments in 9 amino acid length starting from the position of: 11, 15, 24, 28, 31, 35, 36, 42, 48, 49, 53, 78, 79, 97, 20, 28, 35, 37, 43, 49, 60, 65, 77, 85, 86, 21 and 103 of SEQ ID NO:103; 4-13 and 2-14 of SEQ ID NO:104; and fragments in 9 amino acid length starting from the position of: 7 and 10 of SEQ ID NO:104; 4-15, 17-23, 39-52, 4-13, 16-29, 40-50 and 33-41 of SEQ ID NO:105; and fragments in 9 amino acid length starting from the position of: 3, 38, 14 and 41 of SEQ ID NO:105; 4-25 of SEQ ID NO:106; 8-19, 40-47, 67-86, 88-125, 15-25, 48-59, 64-80, 108-118 and 60-70 of SEQ ID NO:107; and fragments in 9 amino acid length starting from the position of: 7, 110, 16, 34 and 109 of SEQ ID NO:107; 4-27, 41-46, and 30-47 of SEQ ID NO:108; and fragments in 9 amino acid length starting from the position of: 19, 1 and 23 of SEQ ID NO:108; 21-28, 34-43, 8-16 and 23-42 of SEQ ID NO:109; and fragments in 9 amino acid length starting from the position of: 34, 19, 28 and 39 of SEQ ID NO:109; 8-20, 24-37, 39-50, 61-67, 69-91, 4-16, 31-42, 84-93 and 42-59 of SEQ ID NO:110; and fragments in 9 amino acid length starting from the position of: 4, 24, 79, 83, 7, 25, 71, 79 and 91 of SEQ ID NO:110; 4-25, 31-39, 59-97, 100-118, 120-129, 26-40, 49-57, 66-95, 97-128, 131-139, 38-47 of SEQ ID NO:111; and fragments in 9 amino acid length starting from the position of: 8, 24, 61, 67, 72, 103, 112, 3, 39, 74, 110 and 119 of SEQ ID NO:111; 7-24, 32-43, 45-57, 32-48 and 27-43 of SEQ ID NO:112; and fragments in 9 amino acid length starting from the position of: 14, 18, 38, 47 and 14 of SEQ ID NO:112; 4-18, 20-26, 31-37, 3-17, 33-43 and 34-53 of SEQ ID NO:113; and fragments in 9 amino acid length starting from the position of: 3, 7, 10 and 9 of SEQ ID NO:113; 15-23, 25-39, 43-50, 62-70, 16-32, 61-73 and 67-84 of SEQ ID NO:114; and fragments in 9 amino acid length starting from the position of: 8 and 64 of SEQ ID NO:114; 4-13, 28-42, 3-14, 28-39 and 1-20 of SEQ ID NO:115; and fragments in 9 amino acid length starting from the position of: 31, 7 and 5 of SEQ ID NO:115; 4-10, 19-26, 21-29 and 5-13 of SEQ ID NO:116; 4-22, 40-46, 51-57, 64-76,

2-10, 45-53, 58-72, 73-82 and 33-45 of SEQ ID NO:117; and fragments in 9 amino acid length starting from the position of: 35, 76, 3, 1 and 66 of SEQ ID NO:117; 12-24, 27-42, 13-30, 34-44 and 1-9 of SEQ ID NO:118; and fragments in 9 amino acid length starting from the position of: 36, 15 and 18 of SEQ ID NO:118; 4-55, 5-15, 17-33 and 26-45 of SEQ ID NO:119; and fragments in 9 amino acid length starting from the position of: 14 and 53 of SEQ ID NO:119; 31-42, 45-52, 86-92, 8-16, 35-52, 83-91 and 27-93 of SEQ ID NO:120; and fragments in 9 amino acid length starting from the position of: 86, 56, 21 and 4 of SEQ ID NO:120; 237 – 256, 508 – 530 of SEQ ID NO:61; 227 – 239 of SEQ ID NO:62; 141 – 160, 168 – 187, 155 – 173 of SEQ ID NO:63; 101 – 124, 161 – 187, 59 – 85, 80 – 106 of SEQ ID NO:64; 97 – 112 of SEQ ID NO:66; 139 – 165 of SEQ ID NO:67; 10 – 21 of SEQ ID NO:68; 667 – 688, 677 – 696, 161 – 187, 183 – 209, 205 – 231, 226 – 252 of SEQ ID NO:69; 603 – 629, 622 – 648, 643 – 669 of SEQ ID NO:70; 529 – 541 of SEQ ID NO:71; 12 – 34, 29 – 51, 46 – 67, 62 – 83 of SEQ ID NO:72; 139 – 151 of SEQ ID NO:73; 246 – 262, 251 – 275 of SEQ ID NO:74; 61 – 84, 79 – 102, 97 – 120, 115 – 138 of SEQ ID NO:75; 325 – 350, 345 – 370, 365 – 389 of SEQ ID NO:76; 324 – 349, 336 – 351 of SEQ ID NO:77; 90 – 100 of SEQ ID NO:78; 274 – 290 of SEQ ID NO:79; 401 – 419 of SEQ ID NO:80; 84 – 107, 101 – 123, 117 – 139 of SEQ ID NO:81; 182 – 199 of SEQ ID NO:82; 911 – 935 of SEQ ID NO:83; 118 – 131 of SEQ ID NO:84; 115 – 128 of SEQ ID NO:85; 74 – 93 of SEQ ID NO:86; 21 – 43, 54 – 76 of SEQ ID NO:87; 554 – 570 of SEQ ID NO:88; 478 – 490 of SEQ ID NO:90; 2 – 14 of SEQ ID NO:91; 7 – 15 of SEQ ID NO:92; 10 – 28 of SEQ ID NO:93; 27 – 34 of SEQ ID NO:94; 17 – 35 of SEQ ID NO:96; 47 – 61 of SEQ ID NO:97; 1-10 of SEQ ID NO:98; 7-20 of SEQ ID NO:99; 7-20 of SEQ ID NO:100; 3-17 of SEQ ID NO:101; 3-17 of SEQ ID NO:102; 41-50 of SEQ ID NO:103; 2-14 of SEQ ID NO:104; 33-41 of SEQ ID NO:105; 4-25 of SEQ ID NO:106; 60-69 of SEQ ID NO:107; 23-41 of SEQ ID NO:109; 42-59 of SEQ ID NO:110; 38-46 of SEQ ID NO:111; 27-43 of SEQ ID NO:112; 34-53 of SEQ ID NO:113; 67-84 of SEQ ID NO:114; 1-20 of SEQ ID NO:115; 33-45 of SEQ ID NO:117; 26-45 of SEQ ID NO:119; 27-53 of SEQ ID NO:120.

39. (New) The hyperimmune serum-reactive antigen or fragment of claim 36, comprising at least 6 contiguous amino acids of any of SEQ ID NOs: 61-120.

40. (New) The hyperimmune serum-reactive antigen or fragment of claim 36, comprising at least 8 contiguous amino acids of any of SEQ ID NOs: 61-120.

41. (New) The hyperimmune serum-reactive antigen or fragment of claim 36, comprising at least 10 contiguous amino acids of any of SEQ ID NOs: 61-120.

42. (New) The hyperimmune serum-reactive antigen or fragment of claim 36, further defined as directed against *C. pneumoniae* infection.
43. (New) A pharmaceutical composition comprising a hyperimmune serum-reactive antigen or fragment of claim 36.
44. (New) The pharmaceutical composition of claim 43, wherein the hyperimmune serum-reactive antigen or fragment is directed against *C. pneumoniae*.
45. (New) The pharmaceutical composition of claim 43, further defined as comprising at least two different hyperimmune serum-reactive antigens and/or fragments.
46. (New) The pharmaceutical composition of claim 45, wherein the at least two different hyperimmune serum-reactive antigens and/or fragments are both directed against *C. pneumoniae*.
47. (New) The pharmaceutical composition of claim 43, further comprising an immunostimulatory substance.
48. (New) The pharmaceutical composition of claim 47, wherein the immunostimulatory substance is a polycationic polymer, an immunostimulatory deoxynucleotide (ODN), a peptide containing at least two LysLeuLys motifs, a neuroactive compound, alum, or a Freund's complete or incomplete adjuvant.
49. (New) The pharmaceutical composition of claim 48, wherein the polycationic polymer is a polycationic peptide.
50. (New) The pharmaceutical composition of claim 48, wherein the neuroactive compound is human growth hormone.
51. (New) The pharmaceutical composition of claim 43, further defined as a vaccine.
52. (New) The pharmaceutical composition of claim 51, further defined as a vaccine for treatment and/or prevention of *C. pneumoniae* infection.
53. (New) A method of vaccinating a subject comprising:
- obtaining a pharmaceutical composition of claim 43; and
- administering the pharmaceutical composition to a subject;
- wherein the subject is vaccinated.

54. (New) The method of claim 53, wherein the subject is a human.
55. (New) The method of claim 53, further defined as a method of treating and/or preventing *C. pneumoniae* infection in the subject.
56. (New) The method of claim 53, wherein the hyperimmune serum-reactive antigen or fragment is directed against *C. pneumoniae*.